

S 1033/US

TITLE OF THE INVENTION

**METHOD FOR DECORATING A SKI BOOT
AND A SKI BOOT DECORATED BY SUCH METHOD**

INVENTOR

Jérôme CHAIGNE

P24410

P24410.S02

S 1033/US

METHOD FOR DECORATING A SKI BOOT AND A SKI BOOT DECORATED BY SUCH METHOD

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is based upon French Patent Application No. 02.15091, filed November 25, 2002, the disclosure of which is hereby incorporated by reference thereto in its entirety and the priority of which is hereby claimed under 35 U.S.C. §119.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The invention relates to a method for decorating a ski boot, particularly an alpine ski boot having a rigid shell portion manufactured by injection molding, as well as to a ski boot decorated by such method.

2. Description of Background and Relevant Information

[0003] Alpine ski boots generally have a rigid plastic shell in which is inserted an inner comfort liner. The plastic shell is typically made by injection molding a thermoplastic material, such as polyurethane, for example. The decoration of this shell is primarily accomplished by mixing dye with the injected material. One thus produces a shell having a uniform color. One can then complete the decoration by applying paint in specific areas. In particular, this application of paint includes adding a trademark name or graphic.

[0004] There are numerous methods for applying paint to shells of ski boots, such as silk screen printing or tampography, for example. The drawback to these techniques is

P24410.S02

S 1033/US

that they are difficult to implement industrially. In addition, once the processes are in place, any variation in color, form of the design and/or its location on the boot is practically impossible to achieve. Finally, the decorations obtained through these processes are not very resistant to abrasion and shock. Therefore, decorations are typically not positioned on the inner sides of the boots which often hit against each other or are scratched by the running edges of the ski.

[0005] Another manner by which the shell of a ski boot can be decorated is to inject two materials of different colors by bi-injection or by overmolding a color after a first color has been applied. Not only is this technique expensive, it is not favorable to making detailed designs.

[0006] It is also possible to decorate a shell of a ski boot by gluing a decoration to the surface. Although this process can appear inexpensive at first, it is nonetheless not found to be desirable due to the low durability that it offers. Indeed, the decoration remains on the outside and is therefore particularly vulnerable to abrasions and impacts, for example, and the adhesive is capable of failing over time, with the decoration peeling from the boot or otherwise becoming detached.

SUMMARY OF THE INVENTION

[0007] An object of the invention is to overcome the aforementioned drawbacks. In particular, an object of the invention is to provide a method for decorating a boot, particularly a ski boot, that allows for a wide variety in the design of the decoration selected, and which is inexpensive.

[0008] An object of the invention also is to provide a method for decorating that allows for a very substantial industrial reactivity in the development and modification of the design of the decoration.

P24410.S02

S 1033/US

[0009] In addition, it is an object of the invention to provide a ski boot whose decoration is very detailed, in the likeness of a photograph, and which resists outside attacks, such as abrasions and impacts that might otherwise tend to remove the decoration.

[0010] The objects of the invention are obtained by providing an ski boot, such as an alpine ski boot having a rigid shell portion made by injecting a thermoplastic material, and which has:

- a decorating layer made from a transparent material, such as polyamide or polyester, which is compatible with transfer techniques, and which has a design constituted by the arrangement of a plurality of different colored inks; and
- a fastening layer positioned between the layer and the thermoplastic material.

[0011] The objects of the invention are also obtained by implementing a method for decorating a shell portion of a ski boot, such as an alpine ski boot, which includes:

- preparing a transfer layer having a design constituted by the arrangement of a plurality of different colored sublimable inks;
- transferring the design from the transfer layer to a decorating layer made from a transparent material, particularly polyamide or polyester, which is compatible with transfer techniques;
- making a complex having the decorating layer with a fastening layer;
- positioning the complex in a mold;
- injection molding a thermoplastic material in the mold;
- extracting the shell portion from the mold.

[0012] Preferably, the injected material is polyurethane.

P24410.S02

S 1033/US

[0013] A transparent material is compatible with the techniques of transfer by sublimation because its melting temperature is higher than the sublimation temperature of the inks used, and its structure has pores that are sufficiently open for allowing the ink in the gaseous state to penetrate the superficial layers of the material. Transparent polyester and polyamide films are particularly adapted to transfer by sublimation.

[0014] In a first embodiment of the decoration method, the complex is made after the transfer of the design to the decorating layer.

[0015] Advantageously, this first embodiment of the invention allows the positioning of the fastening layer within proximity of the design of the decorating layer. As a result, when the complex is affixed to the injected material, the design is largely protected from abrasion or shocks by the decorating layer.

[0016] In a second embodiment of the decorating method, the complex is made before the transfer of the design to the decorating layer.

[0017] Advantageously, the decorating method according to the invention allows for a wide variety of the designs selected. For example, it is possible to decorate a ski boot, such as an alpine ski boot, with a photograph. For mass production, the reactivity of modifying the decorating designs allowed cannot be compared with traditional processes, such as tampography, because, in particular, the change from one design to another requires no modification of the machines used.

[0018] As for small-scale manufacture, the method according to the invention, combined with all of the computerized means for graphics and photography, yields endless possibilities. This is true in that personal printers are now capable of printing on paper or any other sheet-like medium with sublimable ink.

P24410.S02

S 1033/US

BRIEF DESCRIPTION OF DRAWINGS

[0019] The invention will be better understood and other characteristics thereof will be apparent from reading the following description, with reference to the attached drawings, in which:

FIG. 1 is a collar of a ski boot decorated according to the method of the invention;

FIG. 2 schematically shows a first embodiment of the method according to the invention;

FIG. 3 schematically shows a second embodiment of the method according to the invention;

FIG. 4 shows a ski boot decorated according to the method of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0020] FIG. 1 shows the collar 1 of an alpine ski boot, made by injection molding a polyurethane material. The use of polyurethane is not limiting, and one can also use another material commonly used for manufacturing ski boots, such as polypropylene. The collar 1 constitutes a shell portion of the alpine ski boot 15 shown in FIG. 4. Another shell portion is constituted by the shell base 17 that receives the foot of the skier. The collar 1 has a back extended on the medial side, or inner side, of the boot by an inner overlap 3, and on the lateral side, or outer side, by an outer overlap 4. At the base of the back 2, two openings 5, positioned substantially in the area of the articulation axis of the ankle, are used for the passage of means for binding the collar 1 to the shell base 17. When the boot is used, the inner overlap 3 and the outer overlap 4 are brought closer to each other by tightening devices 16 so as to envelope the user's lower leg. These tightening devices 16 are anchored on the inner overlap 3, on the one hand, and on the outer overlap 4, on the other hand.

P24410.S02

S 1033/US

[0021] For a better adaptability and a more precise tightening, the inner overlap 3 has an upper tongue 8 and a lower tongue 7. Each of these tongues is pierced with holes 6 for securing the tightening devices 16.

[0022] A decorating design 9 is pressed on the collar 1 that covers the outer surface of the inner overlap 3, as well as the lower tongue 7, a portion of the upper tongue 8, and a portion of the back as well.

[0023] FIG. 2 shows a first embodiment of the method for preparing the complex before its insertion into an injection mold for the shell portion of the alpine boot.

[0024] First of all (stage I), the transfer layer 10 is prepared. This transfer layer is made of paper, for example, on which has been printed the design 9 that is to be pressed on the shell portion of the boot. Several paper types and several printing techniques, such as off-set or ink jet, can be envisioned for making the transfer layer. It is nevertheless necessary to use inks, for example, sublimable inks, which are compatible with transfer technology.

[0025] Secondly (stage II), the transfer layer 10 is pressed against a decorating layer 11 in the presence of a heat source 12. The decorating layer 11 is made from a transparent or at least translucent material that is compatible with the technology of the transfer. In particular, one can select a polyamide or polyester film. The heat source must be capable of sufficiently heating the entire assembly such that the inks transform to the gaseous state. The heat must not exceed the melting temperature of the film used. In practice, for a polyester film having a melting temperature of approximately 220° C, the heat source must heat the decorating and transfer layers to a temperature comprised between 170° and 200°, or between approximately 170° and 200° C. The ink sublimated by the heat migrates from the transfer layer to the decorating layer in the superficial layers of the decorating film 11.

P24410.S02

S 1033/US

[0026] One then has a decorating layer 11 on which is pressed the design 9. The transfer layer 10 can be discarded or even recycled (stage III). Given the poor compatibility of the decorating layer, which is made from a material favorable to the transfer, such as polyester or polyamide, for example, and of the injected material of the boot portion, such as polyurethane or polypropylene, it is necessary to provide an additional layer for fastening these two materials together (stage IV). The making of the complex of the decorating layer 11 with a fastening layer 13 (stage V) is therefore achieved. The fastening layer 13 is a layer of non-woven material. Once the complex is positioned in the mold and the material is injected, it is the non-woven material that ensures the mechanical fastening of the decorating layer to the injected material. It is also possible to replace the non-woven material with a film of glue/adhesive to achieve a chemical fastening. All that is then left is to cut out the complex 14 according to the sizes desired (stage VI).

[0027] The following parts of the method according to the invention involve positioning the complex 14 in a mold. Because it relates to a decoration, the complex 14 will be pressed against the matrices of the mold. If an object is to decorate the inside of the boot, nothing excludes pressing the complex to the core of the mold.

[0028] Next, the polyurethane is injected in the mold. At the end of the injection cycle, the element is extracted from the mold as shown in FIG. 1, i.e., already decorated.

[0029] In this embodiment, the design 9 is in the decorating layer 11, as close as possible to the fastening layer 13, i.e., spaced from the outer surface of the complex 14. The outer surface of the complex 14 is also the outer surface of the boot once the latter is completed. That is why this embodiment ensures a decorating of the ski boot whose decoration can practically not be altered by shocks or abrasion.

[0030] FIG. 3 shows a second embodiment of the invention.

P24410.S02

S 1033/US

[0031] As in the preceding embodiment, a transfer layer 10 is prepared with the selected design 9 (stage I). The transfer layer is then pressed against a complex 14 within proximity of a heat source 12 (stage II). The complex 14 was prepared previously, and it has a decorating layer, made from a transparent film that is compatible with the techniques of transfer by sublimation, and a fastening layer 13. The complex 14 decorated with the design 9 is then cut out according to the sizes desired (stage IV).

[0032] Although it uses similar materials, this second embodiment is less expensive than the first in that the operation for making the complex occurs prior to the decorating.

[0033] The invention is not limited to the two particular embodiments described herein by way of example, but it also relates to all equivalent embodiments. Likewise, in the example shown, the decorating design is pressed on the collar, whereas it is possible to press it on any portion of the shell, including the shell base.

P24410.S02

S 1033/US

LIST OF REFERENCES

- 1 Collar
- 2 Back
- 3 Inner overlap
- 4 Outer overlap
- 5 Orifices
- 6 Holes
- 7 Lower tongue
- 8 Upper tongue
- 9 Design
- 10 Transfer layer
- 11 Decorating layer
- 12 Heat source
- 13 Fastening layer
- 14 Complex
- 15 Ski boot
- 16 Tightening means
- 17 Shell base